

Environmental Justice, Air Pollution, and Health



November 15, 2007

Air Resources Board



California Environmental Protection Agency

Thank you Mr. Goldstene. Good morning, Chairman Nichols and members of the Board. In this health update, I will discuss the results of three recent studies evaluating the association between air pollution exposures and health outcomes in relation to environmental justice.

Environmental Justice Background

- Environmental Justice: Fair treatment of all people in development of regulations and policies
- Poor and minorities disproportionately exposed
- Do environmental justice communities experience unequal health outcomes?



Senate Bill 115 defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development of environmental laws, regulations, and policies. In addition, the Board approved environmental justice policies in 2001 to establish a framework for incorporating environmental justice into all of ARB's programs.

Minority and low income communities report and research suggests that some neighborhoods experience higher air pollution exposures than others. These exposures are a result of the cumulative impacts of air pollution from multiple sources.

The issue of environmental justice raises the challenging question of whether disparities in environmental exposures result in unequal health outcomes. Today's health update will present recent findings from three studies investigating this question.

Demographics and Birth Outcomes

- Increased risk of pre-term births in disadvantaged neighborhoods with high traffic density¹
- Decreased birth weight associated with PM2.5 exposures²
 - Greater effect for African Americans



¹Ponce NE, KJ Hoggart, M Wilhelm, B Ritz, 2005. Am J Epidemiol, 162:140-148.
Funded by: National Institute of Environmental Health Sciences

²Bell ML, K Ebisu, K Belanger, 2007. EHP, V115: 1118-1124.
Funded by: Health Effects Institute, National Institute of Environmental Health Sciences

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Results from two of these studies are summarized here. The first study was conducted by researchers at UCLA. They examined the association between traffic density and increased risk of pre-term births in Los Angeles County. The investigators found that traffic-related air pollution disproportionately affected neighborhoods with high levels of poverty and unemployment. For example, low socioeconomic status neighborhoods near high traffic areas showed a 30% increased likelihood of preterm births compared to low traffic neighborhoods for all women.

In another study, researchers from Yale University investigated the association between maternal exposure to air pollutants and birth weight. This research was conducted in Connecticut and Massachusetts, and the investigators found an association between PM2.5 exposure and low birth weight for all mothers; however, they found an even greater effect for infants of African American mothers, compared to white mothers.

Respiratory Risk and School Performance in Los Angeles

- Lower academic performance for schools located in census tracts with higher respiratory risk
 - Schools with the highest proportion of Latino and African American students had the highest respiratory risk
- Results persist even after controlling for factors that traditionally influence educational achievement



Rachel Morello-Frosch, Manuel Pastor, And James Sadd (2002). ANNALS, AAPSS, 584, Nov 2002
Funded by: CA Wellness Foundation, CA Endowment, and National Science Foundation

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While children's health is certainly affected by the air quality in their homes and neighborhoods, they spend much of their day in school. In this study, the investigators examined the link between school performance and risk of adverse respiratory outcomes among schoolchildren in the Los Angeles Unified School District.

School performance was measured by the Academic Performance Index, which is based on standardized tests administered to students in grades two through twelve. The results from this study suggest that there is a decrease in the performance of schools located in census tracts with the highest respiratory risk, and schools with the highest proportion of Latino and African American students had the highest respiratory risk.

While many factors contribute to a child's educational achievement, the disparity in academic performance associated with respiratory risk persists even after controlling for factors that traditionally influence educational achievement.

ARB Environmental Justice Research

- Pollution exposure near ports and rail yards
- West Oakland risk assessment
- Evaluations of asthmatic children
 - East Bay Children's Respiratory Health Study
 - Los Angeles Family and Neighborhood Survey
 - Fresno Asthmatic Children's Environment Study



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ARB has a number of studies underway in environmental justice communities. We deployed a network of monitors near the ports of LA and Long Beach to evaluate the air pollution in harbor communities. The ARB is also developing health risk assessments for several rail yards across the state.

We are conducting modeling studies to estimate the health risks from diesel exhaust in West Oakland. In this study, we will estimate the impact of diesel particulate matter emissions from the Port of Oakland, marine vessels in the San Francisco Bay, and locomotive and truck activity.

The ARB is also funding several studies on children with asthma, including some from areas of lower socioeconomic status in both northern and southern California, as well as in the central valley. The names of the studies are listed on this slide.

ARB Environmental Justice Research (continued)

- California birth outcomes
- Oakland self-assessment
- Environmental justice screening tool
- Environmental justice impacts of global climate change in California



Additional studies funded by the ARB are shown in this slide. We have contracted with researchers to investigate the association between air pollution and birth outcomes in poor and minority communities.

In Oakland, our contractors are working with the organization Communities for a Better Environment to map West Oakland with handheld GPS units. As shown in the photograph, community members were recruited to locate emission sources and places frequented by children and the elderly in their neighborhood.

We are working with researchers to develop an environmental justice screening tool. The tool will map the sources of air pollution and the demographic profile of neighborhoods throughout the state.

And finally, as part of the Governor's report on Climate Scenarios, ARB is working with researchers to estimate the impacts of global climate change on environmental justice communities in California.

Conclusions and Implications

- Disparities in environmental exposures remain
- Continued need to include environmental justice in developing regulations and policies
- ARB continues vulnerable populations research



The results of the studies presented today and others add to the body of evidence suggesting that disparities in environmental exposures remain, which demonstrates a continued need to include environmental justice in the development of environmental laws, regulations and policies.

ARB is currently engaged in a number of efforts to improve local air quality, such as the Goods Movement Emission Reduction Program. We will also continue to investigate how air pollution affects residents of low income and minority neighborhoods as part of our research on vulnerable populations, and to incorporate these findings in our programs.

This concludes the health update and we would be happy to answer any questions.

Thank you very much.